

Overview

The Transportation chapter provides general guidance for transportation decisions and for accommodating growth and development as indicated in The Land Use Plan, improving safety, efficiency, and accessibility countywide. Modes of transportation in the county include roads, an airport, trains, pedestrian and bicycle facilities, and limited bus service. Although a more balanced multimodal transportation system (i.e., multiple modes of transport; for example automobile, rail, and bus) is recommended, the automobile is anticipated to be the dominant mode of travel in the county well into the future. This information will be reevaluated in conjunction with each five-year update of the Comprehensive Plan.



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Regional and statewide travel is projected to increase concurrently with the growth of the county's population. The number of trips into the county is expected to increase as the population grows and employment expands. According to 2014 commuting pattern data from the U.S. Census Bureau, about 51,000 people live and work in Chesterfield County. Approximately 108,000 individuals live in the county, but commute elsewhere for work, primarily Henrico and Richmond. Additionally, about 75,000 workers commute into Chesterfield for work from the surrounding region. Over time, this commuting pattern may change with additional employment opportunities in the county, resulting in fewer county residents commuting to other jurisdictions and more people entering the county for employment.

In addition to commuting patterns, socioeconomic factors such as the aging population, number of individuals with disabilities, vehicle availability and declining household income have an impact on transportation needs. According to the 2015 American Community Survey, there are over 43,000 individuals age 65 and older and over 32,000 individuals with disabilities in the county. The senior population is projected to grow to nearly 89,000 by 2040. Additionally, 3 percent of county households do not have a vehicle and 27 percent have one vehicle available as of 2015. According to the 2015 Consumer Expenditure Survey by the Bureau of Labor Statistics, transportation is the second largest expense for households in the nation. As incomes are declining, households may become more limited in what they can afford. These socioeconomic trends may increase the need for a variety of mobility options. Changes in technology may also have an impact on future needs with increasing options for shared-use transportation and the future of vehicle automation.

DESIRED OUTCOMES OF THIS CHAPTER

- **Create a Safe & Efficient Multimodal Transportation Network**
- **Support Mobility Options for All Ages & Abilities**
- **Promote Context Sensitive, Innovative Designs**
- **Support Comprehensive Funding Strategies**
- **Enhance Connections Between Community Destinations**
- **Support Business Development Efforts**

Transportation Vision

Chesterfield County strives to create a balanced, efficient, multi-modal transportation network that provides all users with the ability to reach their destinations safely. This chapter is meant to guide future development of the county's transportation network including, roads and highways for motorized and non-motorized transportation including transit, bicycle and pedestrian networks. While roadways are recognized as the backbone of the county's transportation network, alternate modes of transportation will need to be incorporated to meet mobility challenges of the future. Innovations in mobility and technology continue to evolve presenting a range of creative solutions such as on-demand transit options including ridesharing (e.g., Uber, Lyft), bike-sharing and car-sharing (e.g., Zipcar). Autonomous vehicles with the ability to communicate with each other and the roadside infrastructure are just on the horizon and have the potential to transform how people travel in the future. These types of solutions in conjunction with coordinated land use policies will ensure the transportation network continues to develop in a sustainable pattern that supports the county's mobility goals. Chesterfield County will need to stay informed on emerging technologies and practices while proactively exploring ways to implement them where applicable to meet the diverse transportation needs of the county well into the future.

Roads-Thoroughfare Plan

In 1932, the county's roads, like roads in most other Virginia counties, became part of the Virginia State Highway System which is managed and maintained by the Virginia Department of Transportation (VDOT). As the county grew and prospered, roads were constructed to accommodate residents and commerce. Between 1998 and 2006, over 200 miles of roads were built, primarily within new county subdivisions, the most of any Virginia locality during that period. As of 2016, VDOT maintains approximately 1,900 miles of roads in the county.



The county proactively plans for road improvements and new transportation facilities based upon anticipated growth and development as suggested on the Land Use Plan Map. Road improvements are made either by the public or private sector. Public sector projects are initiated when traffic conditions, such as congestion or safety, warrant the need and as funding becomes available. Private sector improvements are typically provided in conjunction with development based upon the impact of the project.

The Transportation Department develops a Thoroughfare Plan as part of the Comprehensive Plan. The Thoroughfare Plan identifies the backbone network of existing and proposed roads necessary to reasonably accommodate anticipated traffic generated by development of the entire county at the time of build-out. In addition to widening existing roads, construction of many new roads will be necessary to accommodate future growth. The Plan includes extension of a beltway system with two limited access roads: Powhite Parkway from Charter Colony Parkway to Hull Street Road; and the East-West Freeway from Route 360 to Interstate 95.

The ***Code of Virginia*** requires that a comprehensive plan show corridors of regional or statewide significance, as defined by the Commonwealth Transportation Board in the *Statewide Transportation Plan*. Interstate 95 that extends through the county is designated as a Corridor of Statewide Significance. To qualify, the corridor must meet all of the following criteria:

- Involve multiple modes (highway, rail, inter-regional transit, airport, water port) or is a freight corridor and extends beyond an individual region
- Connect regions/states/major activity centers
- Provide a unique statewide function and/or address statewide goals.

MODELING DEVELOPMENT

Development of a Thoroughfare Plan typically includes traffic modeling. The Transportation Department uses a countywide travel demand model to forecast traffic based upon a specific land use scenario. The results of the modeling include anticipated traffic volumes and levels of service which are used to assist in determining the need for new roads and the widening of existing roads.

Land Use Assumptions

For transportation planning purposes, a land use scenario was used that assumes that the county will ultimately be fully developed (“build-out”). Build-out is expected to take many, many years. The Land Use Plan does not anticipate build-out during the lifecycle of this Comprehensive Plan. However, evaluation of a build-out potential is necessary to establish a foundation for an adequate transportation network should future land uses differ from those recommended for the Rural Residential/Agricultural area. The build-out scenario assumes development based upon the recommendations of the Land Use Plan, except for that area designated for Rural Residential/Agricultural. To plan for possible future growth in the Rural Residential/Agricultural area and the resulting impact on the road network, a land use scenario was developed assuming that at some time in the future public facilities to include public wastewater service would be available to support alternative land uses.

The build-out scenario assumes the following land uses for the Residential/Agricultural area:

- Neighborhood Business uses along Route 360
- Regional Mixed Uses at the interchanges of a proposed East-West Freeway
- Residential development of 2 units to the acre in the remaining area.



The build-out scenario for the Rural Residential/Agricultural area is anticipated to yield approximately 111,000 residential units and 41 million square feet of commercial/industrial uses. It should be recognized that the build-out scenario will exceed current local, state and federal funding for road infrastructure that functions at desired levels of service, therefore, resulting in increased road congestion.

Road Network Assumptions

The existing road network and road improvements committed to by public and private funding were initially evaluated to assess their ability to accommodate anticipated traffic generated by the build-out scenario.

The modeling also assumed various communities' desires to retain the unique character of their area by maintaining some roads in their existing conditions, even if the result would be congestion. These roads include:

- Route 60 through the Village of Midlothian
- Route 10 through Chester Village
- Buford Road
- Forest Hill Avenue
- Old Gun Road
- Old Buckingham Road
- Winterfield Road
- Ruffin Mill Road from Ashton Park Drive to Ramblewood Drive
- River Road through the Village of Matoaca

The Transportation Department evaluated the outputs from the modeling which included traffic volumes and levels of service. The Department then determined reasonable road improvements (improvements to existing roads and construction of new roads) necessary to accommodate the forecasted traffic. The number of lanes modeled is not the number that currently exist, but rather the lanes that may be necessary to support build-out development. The roads were then classified based upon their function and right of way width necessary to accommodate the number of lanes for the anticipated traffic volume.



Level of Service (LOS) is a measure of traffic flow operations on a specific road segment. There are six levels of service categories, A through F, used to evaluate roads. Levels of Service A through D are generally considered acceptable, while Levels E and F are considered congested and undesirable.

Road Classifications are based upon factors such as traffic volumes and trip type (local or regional). The right of way necessary to accommodate the lanes of pavement for each road classification is then established. Additional right of way width for each classification may be needed for utility relocations, environmental mitigation, grade changes, turn lanes, intersection improvements, transit, and bicycle and pedestrian facilities. The county uses four categories of functional classifications:

- Limited Access roads accommodate high-speed traffic with limited or no access to adjacent property, have some degree of separation of opposing traffic flow, and are generally accessed by interchanges. These roads typically have a right of way width of 200 feet, generally accommodating six travel lanes. Interchanges may require 90 to 100 acres of right of way. Additional right of way may be needed to accommodate additional lanes of pavement or collector-distributor roads at interchanges.
- Major Arterial roads accommodate high volumes of traffic, and provide primary connections between neighborhoods and employment/retail centers and to limited access roads. The county has two classifications for major arterials, the first having a right of way width of 90 feet, generally accommodating four travel lanes, and the second having a right of way width of 120 to 200 feet, generally accommodating six to eight travel lanes.
- Collector roads route traffic to and from major arterials and accommodate traffic within and between neighborhoods and commercial/industrial developments. The county has two classifications of collector roads, the first having a right of way width of 60 feet, generally accommodating two travel lanes, and the second having a right of way width of 70 feet, generally accommodating two or four travel lanes.
- Local roads accommodate low traffic volumes within and between neighborhoods and commercial/industrial developments. These roads typically have a right of way width of 50 to 60 feet generally accommodating two travel lanes. New local roads are not identified on the Thoroughfare Plan. The need for these roads will be determined on a case by case basis through the development review process.



STREET DESIGN

Roads and streets play a critical role in shaping communities. They are the primary way in which different land uses and communities are connected. Past development has created a pattern of disconnected land uses and neighborhoods that are centered around the automobile. Good road design is a balancing act and should accommodate the predominant modes of transportation in a given area, both now and in the future, while mitigating the impacts on surrounding properties and the environment. As noted in the overview, many socioeconomic factors impact the mobility of a community. Road design that takes multiple users into account can provide a more equitable and efficient transportation network. However, this is not possible or appropriate in every area. For example, including pedestrian facilities on a low-volume, rural road may not be desirable, feasible or a good use of funds. General street and road design concepts and examples of various road types and layouts are discussed and illustrated below. Where appropriate, policies and ordinances should be revised and/or developed to encourage context-sensitive road designs. For example, a decision-making tool should be developed that guides staff and private developers in making design decisions. This tool should take several factors into account including future land use, traffic volume, and vehicular and non-vehicular crash statistics.

Context Sensitive

Good road design should consider the context of development around the road – whether it is residential or commercial in nature and whether the road is in an urban, suburban or rural setting. Road design will look different for each of these cases, but should acknowledge all potential users and future land use. In addition to providing safe, efficient means to travel, roads should add social and economic value to the community it serves. Appropriate streetscaping through use of landscaping, lighting, wayfinding and other amenities can assist in creating desirable public spaces. Other design considerations should include pedestrian/bike crossings and facility widths.

All Ages, All Abilities

Roads should provide a means of transportation for everyone including persons with disabilities. The preferred facility in a suburban setting to accommodate a wide variety of users is a paved shared use path. This single facility can comfortably be used by those who walk, jog, ride a bike or use a wheelchair or stroller. Facility design should incorporate ADA accessibility principles and standards.

Grid Street Design

Establishing road grids in more intensely developed areas such as mixed use projects is desirable in creating a more walkable place. In suburban settings, it is desirable to develop parallel roadways to relieve congestion along major highways and reduce cut through traffic in neighborhoods. Block lengths should be considered to best accommodate both pedestrians and drivers alike. This grid or parallel road system should provide maximum connectivity between various land uses and offer mobility options to users.

Access Management

Efficient access management practices should be encouraged to keep traffic moving and make it safer for pedestrians. Practices such as the frequency, location and spacing of driveways and medians should be established for both new and redeveloping corridors. Access management can reduce crashes, increase traffic flow and make it easier to access uses along a corridor.

Safe Intersections for All

Intersections of roads are often barriers to safe walking and biking. Many roads are built with sidewalks, but it is not possible to safely cross the road without a pedestrian actuated signal, signage and/or road markings. Existing intersections should be redesigned and standards for new intersections should be established to encourage biking and walking, especially in areas where sidewalks currently exist or if the intersection appears on the Bikeways and Trails Plan.

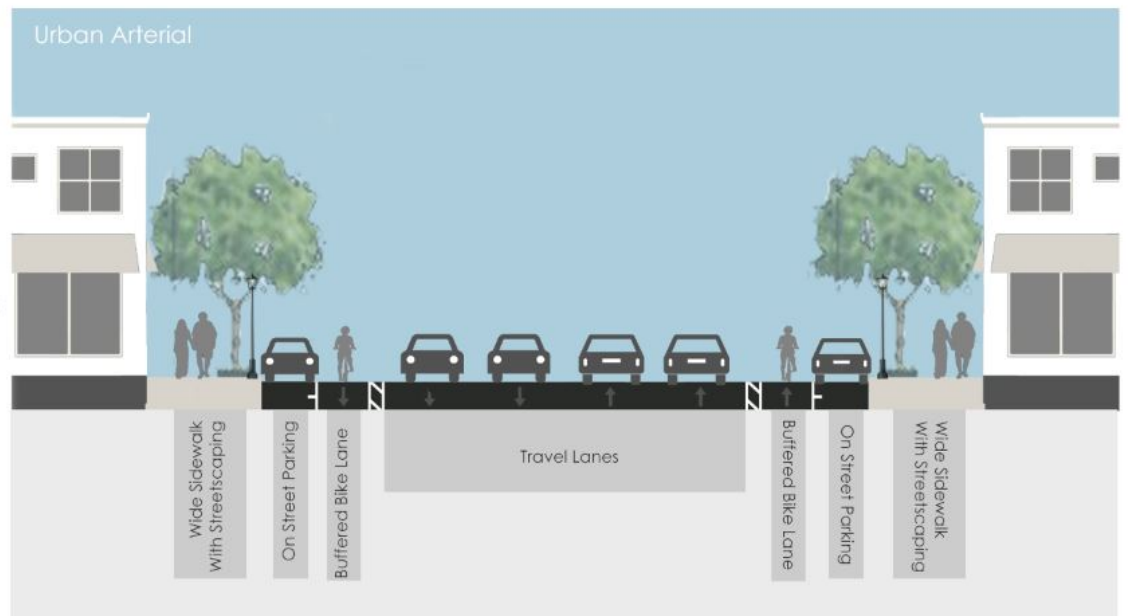
Bikeways and Trails Plan and Special Area Plans

The Bikeways and Trails Plan Map, found in Chapter 14, provides the framework to create a network of trails and roads that will serve as the backbone for safe, comfortable and convenient routes for people to bike and walk for transportation or recreation needs. The Special Area Plans, found in Chapter 11, further refine the Bikeways and Trails Plan network by identifying specific locations and facility types. In addition, Special Area Plans may recommend sidewalks, neighborhood byway routes and treatments and/or intersections and crossing improvements. In addition to this network, other roads and trails should be built to access the network. This street design section strives to promote roads that serve as connections to the Bikeways and Trails Plan network.

The following cross sections serve as examples or general templates for the design of roads. Each situation is unique with possible utility, environmental, social or other constraints. These recommended cross sections should be modified to address unique situations and community character, with the intent to safely and comfortably accommodate all users.

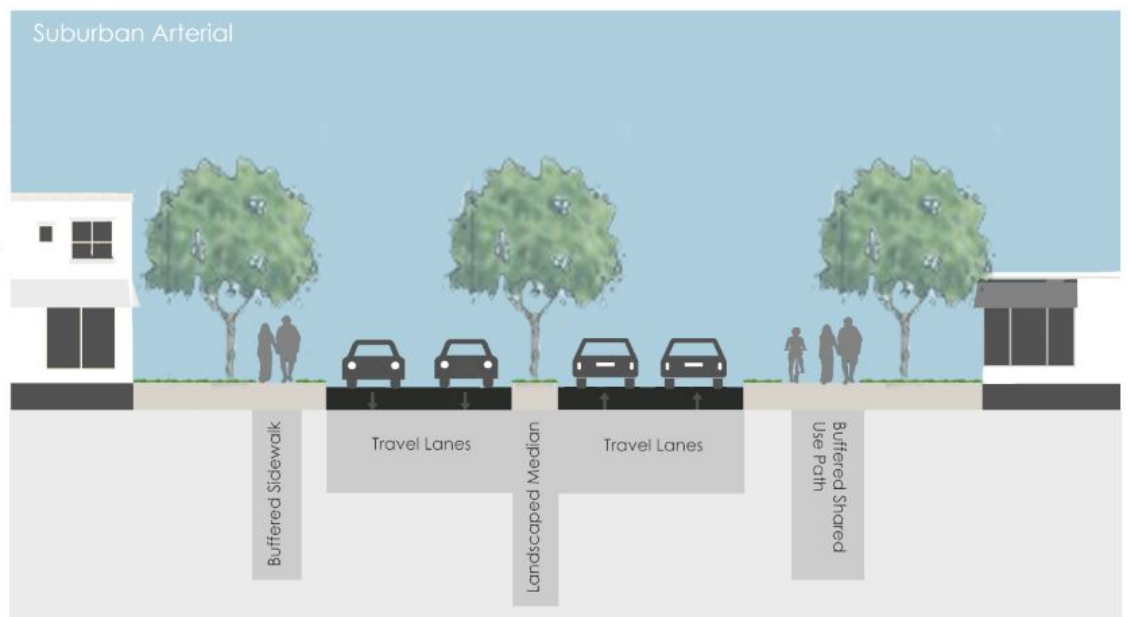
**Urban Arterial
Design Features:**

Wide Sidewalks - 10' Minimum
Street Trees
Pedestrian Lighting
Benches and Trash Cans
On Street Parking
Buffered Bike Lane
11' Travel Lane Width
Pedestrian Signals and Crosswalks



**Suburban Arterial
Design Features:**

Buffered Sidewalks - 5' Minimum
Buffered Shared Use Path
Landscaped Median
12' Travel Lane Width
Pedestrian Signals and Crosswalks
at Key Intersections



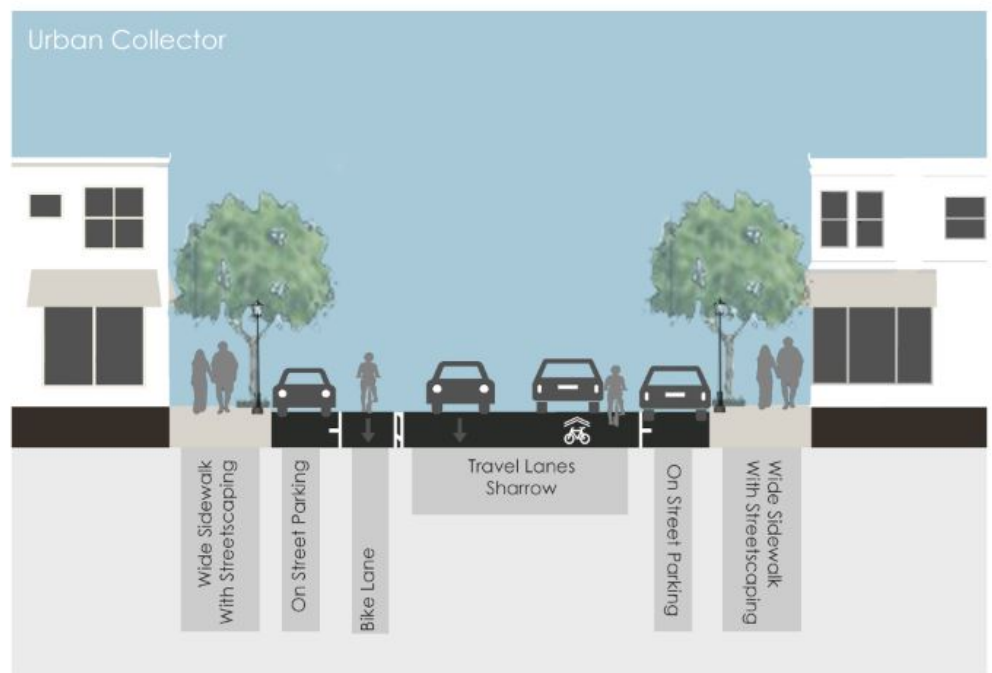
Rural Arterial and Rural Collector
Design Features:

5' Paved Shoulder
5' Bike Lane plus 5' Paved Shoulder
12' Travel Lane Width



Urban Collector
Design Features:

Sidewalks - 6' Minimum
Street Trees
Pedestrian Lighting
On Street Parking
On Road Bike Facility
Bike Lane or Sharrow
11' Travel Lane Width



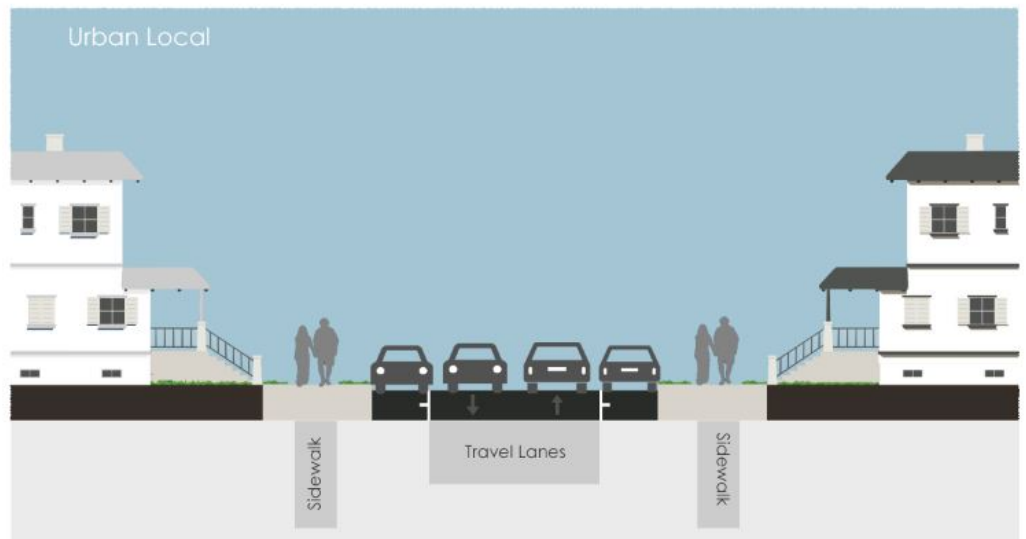
**Suburban Collector
Design Features:**

Sidewalks - 5' Separated from Road
Shared Use Path
11' Travel Lane Width



**Urban Local
Design Features:**

Sidewalks - 6'
On Street Parking
Neighborhood Byway and Signage
10' Travel Lane Width



Suburban Local
Design Features:

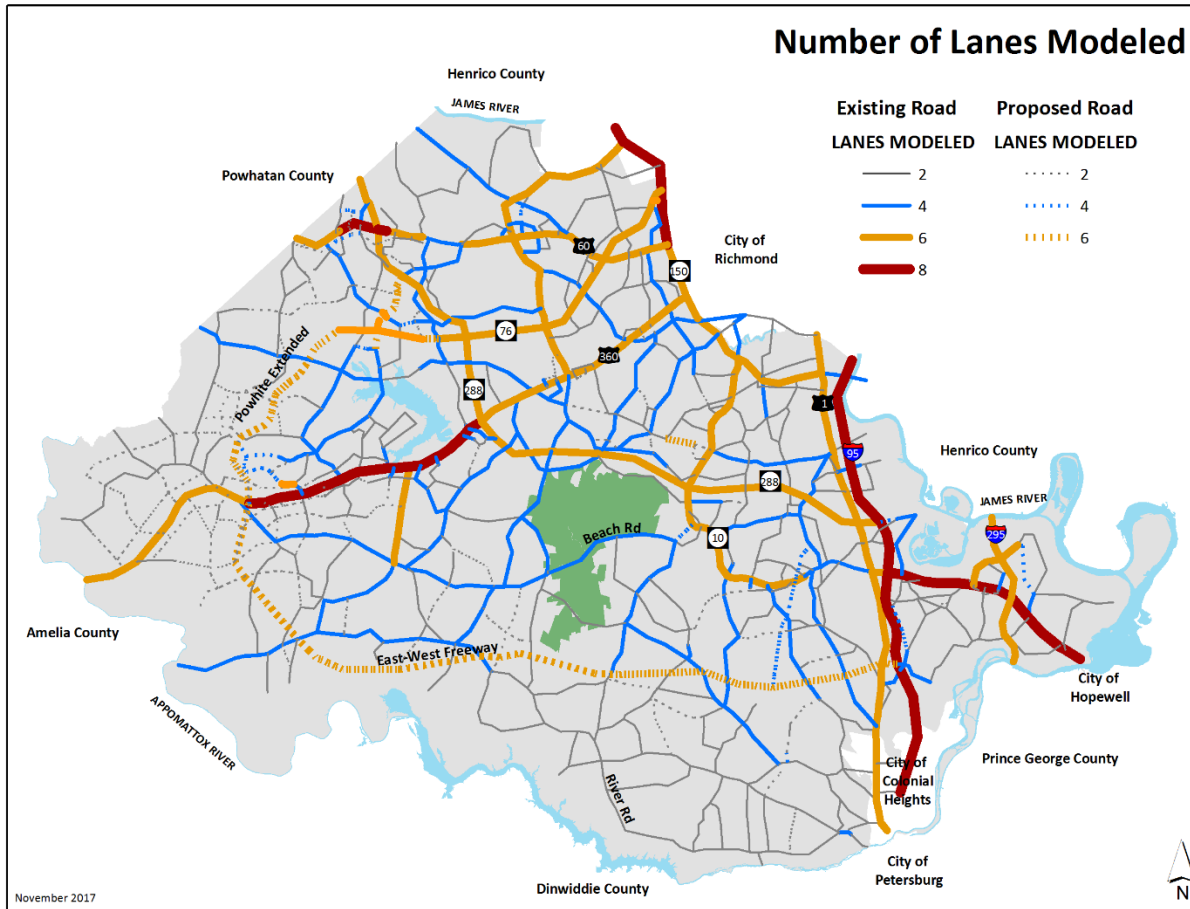
Sidewalks - 5' Separated from Road
Neighborhood Byway and Signage
11' Travel Lane Width



Rural Local
Design Features:

11' Travel Lane Width
Drainage Ditches





MODELING RESULTS

A Thoroughfare Plan was developed based upon the results of the modeling and the Transportation Department's evaluations. Solving all peak hour traffic congestion by increasing road capacity is not always the right solution. Sometimes, the negative impacts of road widening on adjacent properties or the benefits of economic development outweigh achieving acceptable levels of service. To that end, the Thoroughfare Plan does not address all projected capacity needs. It is expected that the long-term build-out scenario will result in various levels of congestion, including Levels of Service E and F. However, implementation of the Thoroughfare Plan should provide a reasonable level of mobility.

As previously noted, the Thoroughfare Plan identifies the backbone network of roads necessary to reasonably accommodate anticipated traffic resulting from development of the entire county at the time of build-out. Generally, the Plan will be implemented in phases as development occurs.

The Thoroughfare Plan is a general guide. During the development review process that may include more detailed analysis, the Transportation Department may recommend modifications to the road network, road alignments and rights of way widths, provided the adjustments meet the spirit and intent of the Comprehensive Plan.

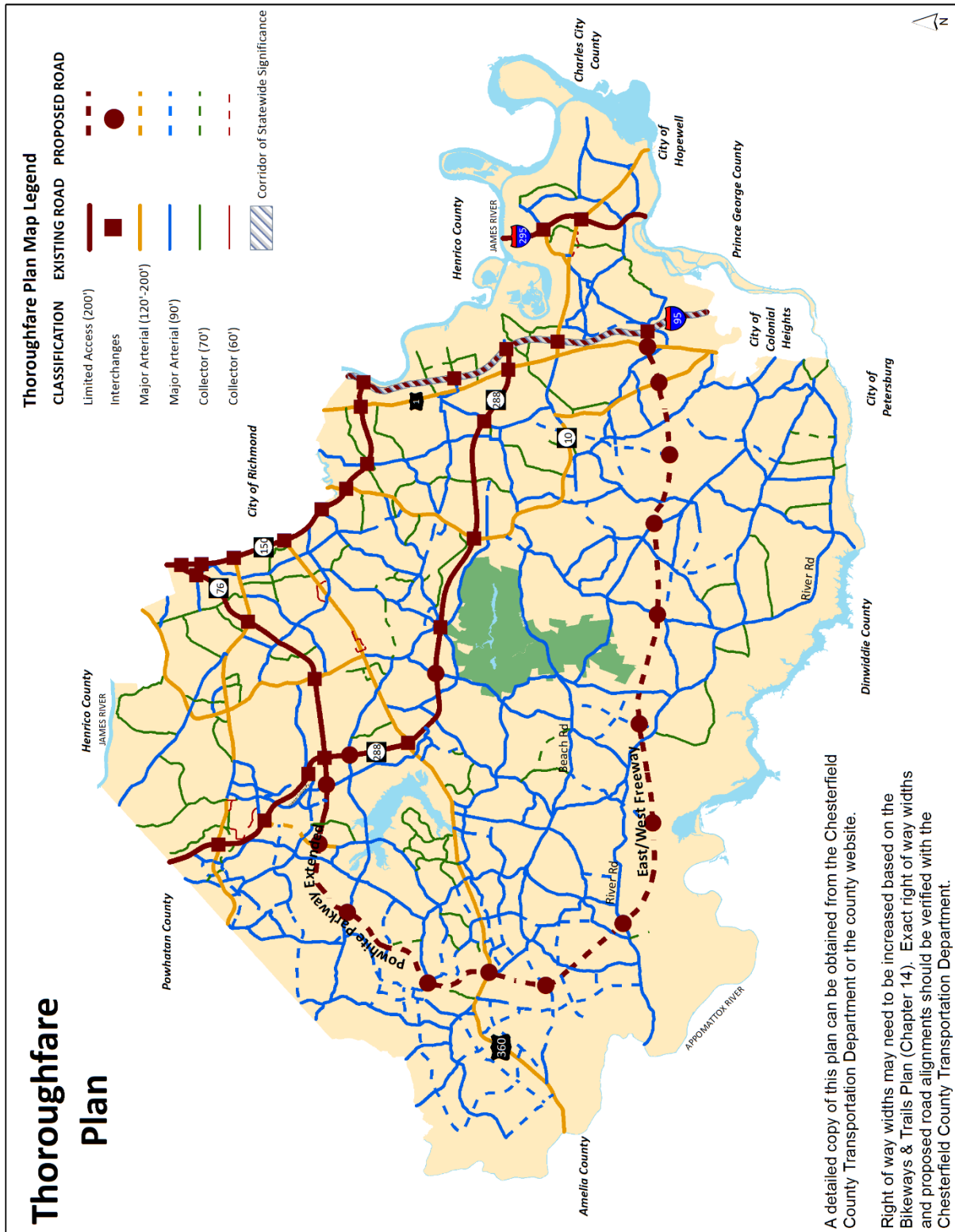
Intersection Improvements

Based upon forecasted traffic volumes, existing intersections may need to be grade separated or converted to an alternative intersection configuration. Grade separated intersections are those that bridge one road over or under another road. Some example alternative intersections include Restricted Crossing U-Turns (RCUT), Median U-Turn (MUT), and Displaced Left-Turn (DLT). Some of these intersections are:

- Route 60/Huguenot Road/Courthouse Road
- Route 360/Courthouse Road
- Route 360/Old Hundred Road/Commonwealth Centre Parkway
- Route 1/Route 10
- Route 10/Meadowville Road/Old Bermuda Hundred Road.

Powwhite Parkway Extension

The Powwhite Parkway Extension to Woolridge Road Extended, Woolridge Road Extended, the widening of Woolridge Road to Otterdale Road and the widening of Otterdale Road to Hull Street Road should be a priority for the county. The Powwhite Parkway Extension should only be constructed when necessary to accommodate established traffic demands, and then only when it is a public priority. Tolls are undesirable.



FUNDING

The **Code of Virginia** requires that a cost estimate for road improvements be provided in comprehensive plans. For the purposes of this planning effort, improving existing roads to achieve an acceptable of Level of Service D or better by the time of build-out is estimated at approximately \$6.8 billion in construction cost.



Funding for road improvements predominantly comes from taxes, primarily gasoline tax. These funds are augmented through bond referendums, cash proffers and the Capital Improvement Program. Road improvements are sometimes completed in conjunction with major development. The majority of road funds for localities throughout the state are allocated by the Virginia Commonwealth Transportation Board. These funds are administered by the Virginia Department of Transportation. In 2016, the average cost to widen a road from two lanes to four lanes is \$12.8 million per mile, and to widen a road from two to six lanes is \$17.3

million. Over the next six years, local, state and federal funds for county road construction improvements are anticipated to average approximately \$26.5 million per year. The county aggressively competes with other jurisdictions for funding from various programs. The Transportation Department evaluates road capacities, accident information and development patterns to justify funding for improvements to the most deficient road sections.

The Board of Supervisors, jointly with the Virginia Department of Transportation, annually establishes priorities for the construction and improvement of secondary roads in the county through the adoption of a Secondary Road Six-Year Improvement Plan (SSYP). The Board of Supervisors also annually adopts county priorities for primary and interstate road improvements, and requests the Commonwealth Transportation Board (CTB) to fund the priorities. The CTB establishes statewide priorities by allocating funding through the adoption of a Six-Year Improvement Program. The projects listed on the following page were approved in June 2017 for the FY 2018 – 2023 SSYP. A summary of unfunded transportation needs from the FY 2017 – 2021 Adopted Capital Improvement Plan is provided on page 16.

In 2015, the Office of Intermodal Planning and Investment (OIPI) developed the Statewide Transportation Needs Assessment process as part of the VTrans Multimodal Transportation Plan (VMTP). The VMTP, along with the VTrans Vision Plan make up the overall statewide Transportation Plan, VTrans2040. State code requires the county's Comprehensive Plan to be consistent with VTrans. The VTrans needs being addressed by each Six-Year Improvement project is summarized on the following page. Additional VTrans2040 information can be found [here](#).

In 2014, House Bill 2 was signed into law, requiring development of a prioritization process (SMART SCALE) for projects funded by the CTB. The purpose of SMART SCALE is to fund the appropriate transportation projects through a prioritization process that evaluates each project's merits using key factors including improvements to safety, congestion reduction, accessibility, land use, economic development and the environment. SMART SCALE requires the CTB to develop and implement a quantifiable and transparent prioritization process for making funding decisions for capacity enhancing projects within the VDOT Six-Year Improvement Program.

The ***Code of Virginia*** permits the CTB to make an equivalent matching allocation, through the Revenue Sharing Program, to any county of up to \$5.0 million in funds to construct, maintain, or improve primary and secondary highway systems. In 2014, Chesterfield County adopted an additional vehicle registration fee to generate \$6 - 7 million annually to invest in the state's Revenue Sharing program, which matches local funding put towards road improvements dollar for dollar.

In most instances, the cost of new road construction and improvements to existing roads to mitigate traffic impacts from individual development is borne by the private sector. Road improvements necessary to adequately serve significant economic development sites may be too expensive for a single developer, necessitating special funding through a Transportation District or Community Development Authority. These districts or authorities generally place an additional tax on property within an identified area such as those identified as "Economic Development Opportunity Sites" in the Economic Development chapter.

A Transportation District ("Powhite Parkway-Charter Colony Parkway Interchange Service District") has been established to improve transportation services primarily for the CenterPointe, Waterford and Acropolis Developments. The District will provide funds to construct an interchange at the intersection of Powhite and Charter Colony Parkways and widen a part of Powhite Parkway. The road improvements identified in the District should be constructed as soon as funding is available.

A Community Development Authority ("Lower Magnolia Green Community Development Authority") has also been established to assist in addressing the traffic impact for part of the Magnolia Green Development. The Authority will assist in financing the widening of Woolridge Road from Otterdale Road to the four-lane section of Woolridge Road across the Swift Creek Reservoir. The county is responsible for bearing the cost of acquiring the necessary right of way and permits. Additional financing could include cash proffers or appropriations from other sources, as determined by the Board of Supervisors. Developers will also assist in financing or constructing improvements as development occurs. The road improvements identified in the Authority should be constructed as soon as funding is available. Design plans and right of way acquisition is complete for the Woolridge Road section with construction anticipated for Summer of 2018.

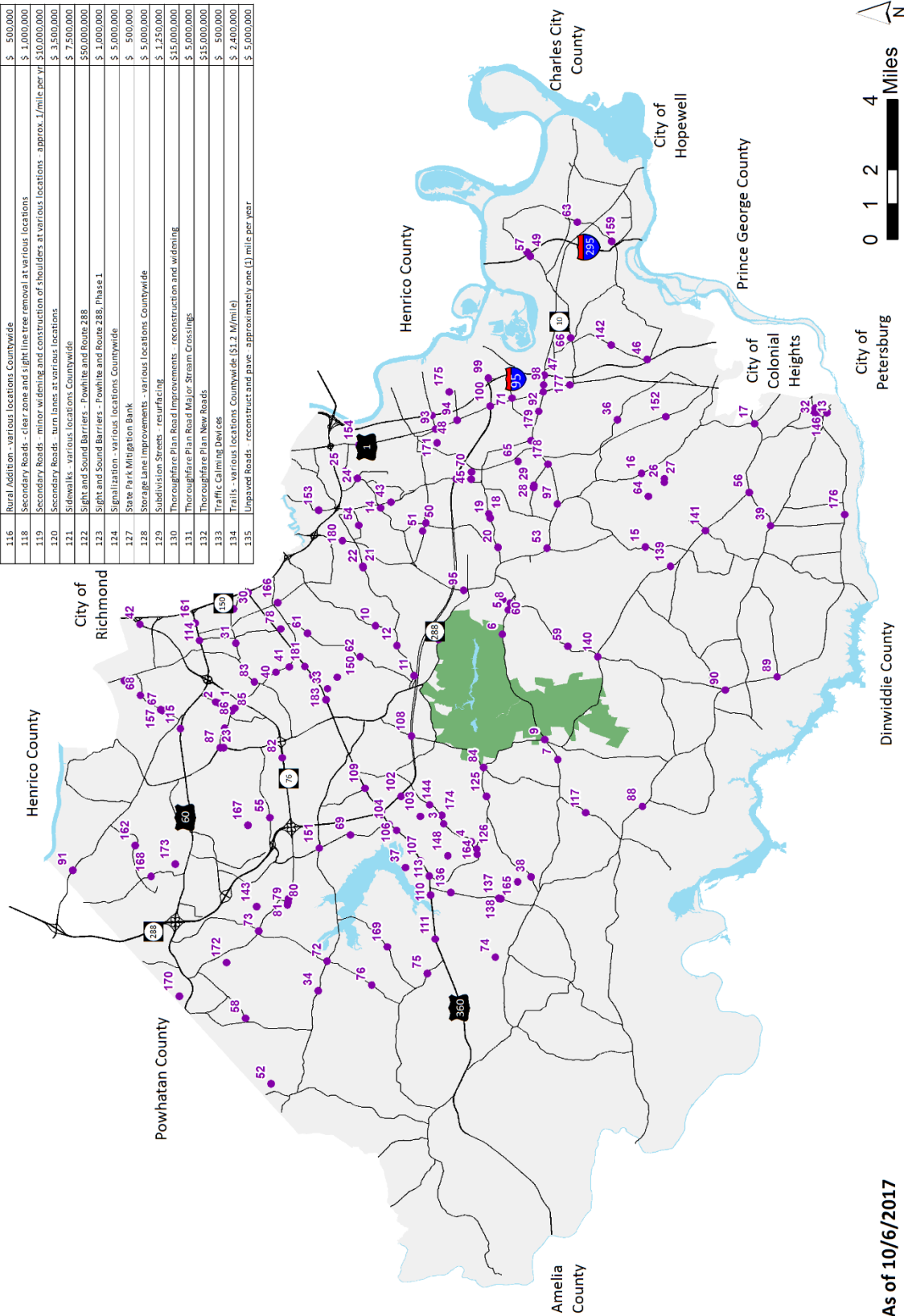
Chesterfield County Secondary Six-Year Improvement Plan Projects FY18 – FY23

VDOT UPC#	Location	Type	Status	Estimate	VTrans2040 Need
111105	Stratton Park Pedestrian Improvements	Pedestrian Improvements	PE Underway	\$1,100,000	UDA
109322	I-95 at Route 10	Interchange Improvement	PE Underway	\$10,000,000	CoSS, UDA, Regional Network
111302	I-95 Bridge over Reymet Road	Bridge Rehabilitation	PE Underway	\$11,000,000	SGR
111466	I-95 from Route 10 to Route 288	Interstate Widening	PE Underway	\$28,770,000	CoSS, UDA, Safety, Regional Network
108887	Harrowgate Road/Cougar Trail	Pedestrian Improvements	FY2020	\$890,000	Safety, Regional Network
15988	Route 1 Bridge over CSX (North of Bellwood Road)	Bridge Replacement	Complete	\$19,062,000	SGR
104661	Route 1 at Happy Hill Road & Route 1 at Woods Edge Road	Intersection Improvement	RW Underway	\$7,705,000	UDA, Safety
111712	Route 1 (Marina Drive to Merriewood Road)	Sidewalk	FY2022	\$2,083,000	UDA, Safety, Regional Network
101020 110393	Route 10 (Bermuda Triangle Road to Meadowville Road)	Roadway Widening	RW Underway	\$54,191,000	UDA, Safety, Regional Network
102952	Route 10 (Route 1 to I-95)	Roadway Widening	RW Underway	\$9,000,000	UDA, Safety, Regional Network
104889	WB Route 10 (Whitepine Road to Frith Lane)	Roadway Widening	PE Underway	\$12,000,000	UDA, Regional Network
111467	SB RT 288 to WB US 360 Off-Ramp, US 360 at Chital Drive	Roadway Widening, PNR Lot	PE Underway	\$14,562,000	UDA, Safety, Regional Network
104886	US 360 at Spring Run Road	Intersection Improvement	PE Underway	\$3,000,000	UDA, Safety
104890	US 360 (Lonas Parkway to Castle Rock Road)	Roadway Widening	PE Underway	\$6,400,000	UDA, Safety, Regional Network
111713	Bailey Bridge Connector (Bailey Bridge Road to Brad McNeer Parkway)	New Roadway Construction	FY2020	\$22,960,000	UDA, Safety, Regional Network
101028	Matoaca Road at Hickory Road	Intersection Improvement	RW Underway	\$3,025,000	Safety
101243	Genito Road Bridge over Tomahawk Creek	Bridge Replacement	Complete	\$3,209,000	SGR
107059	Genito Road at Otterdale Road	Intersection Improvement	RW Underway	\$3,928,000	UDA
107083	Winterpock Road (US 360 to Royal Birkdale Parkway)	Roadway Widening	PE Underway	\$16,000,000	UDA, Safety, Regional Network
109229	Lakeview Road at Branders Bridge Road	Intersection Improvement	FY2021	\$3,427,000	Safety
103469	Nash Road Bridge over Rita Branch	Bridge Replacement	PE Underway	\$2,877,000	SGR
107088	Nash Road Extension (Beach Road to Route 10)	New Roadway Construction	PE Underway	\$19,000,000	UDA, Regional Network

VDOT UPC#	Location	Type	Status	Estimate	VTrans2040 Need
106197	Hopkins Road at Kingsland Road	Intersection Improvement	PE Underway	\$3,400,000	Safety
108885	Hopkins Road (Bonniebank Road to S. Melody Road)	Sidewalk	FY2020	\$967,000	Safety, Regional Network
111714	Cogbill Road/Hopkins Road/Chippenham Parkway	PNR Lot	FY2022	\$2,945,000	Safety, Regional Network
107085 111299	Dundas Road (Meadowdale Boulevard to Strathmore Road)	Bridge Replacement and Pedestrian Improvements	PE Underway	\$9,519,000	SGR, UDA, Regional Network
107086	Hicks Road (Mt. Gilead Boulevard to Cardiff Lane)	Roadway Reconstruction	RW Underway	\$3,100,000	UDA, Safety
108644	Belmont Road (Whitepine Road to Courthouse Road)	Roadway Reconstruction	PE Underway	\$3,638,000	UDA, Regional Network
108641	Bailey Bridge Road (Spring Run Road to Sunday Silence Lane)	Spot Widening	PE Underway	\$3,820,000	Regional Network
108639	Elkhardt Road (Ruthers Road/Pocoshock Road to Tillers Ridge Drive)	Roadway, Pedestrian, Bike	PE Underway	\$4,110,000	UDA, Safety, Regional Network
105676	Arch Road (Route 60 to Arboretum Parkway)	Roadway Widening, Roundabout	CN 2018	\$4,480,000	Safety
107089	Robious Road (County Line to Robious Forest Way)	Roadway Widening	RW Underway	\$7,250,000	UDA
T20005	N. Enon Church Road (Route 10 to Meadowville Technology Parkway)	Roadway Widening	FY2022	\$4,215,000	UDA, Safety, Regional Network
108638	Ecoff Avenue (Ken Drive to Ivywood Road)	Spot Widening	PE Underway	\$4,260,000	Safety, Regional Network
108647	McRae Road (Forest Hill Avenue to Rockaway Road)	Sidewalk	PE Underway	\$4,200,000	UDA, Safety
111715	Courthouse Road (Salem Church Road to Courts Complex Road)	Mixed-Use Trail	FY2022	\$1,200,000	Regional Network
108883	Deer Run Road (Chital Drive to Key Deer Drive)	Sidewalk	FY2022	\$550,000	UDA, Safety
FY = Fiscal Year					
PE = Preliminary Engineering					
RW = Right-of-Way Acquisition					
CN = Construction					
PNR = Park and Ride					
CoSS = Corridor of Statewide Significance					
UDA = Urban Development Area					
SGR = State of Good Repair					

FY2018-2022 Transportation Unfunded Requests

Number	Project Description	Estimated Cost
35	GRFC Express Service	\$ 2,000,000
77	Park and Ride Facilities/Commuter Rail Lots	\$ 2,000,000
116	Rural Addition - various locations Countywide	\$ 500,000
118	Secondary Roads - clear zone and sight line tree removal at various locations	\$ 1,000,000
119	Secondary Roads - minor widening and construction of shoulders at various locations - approx. 1/mile per yr	\$10,000,000
120	Secondary Roads - turn lanes at various locations	\$ 3,500,000
121	Sidewalks - various locations Countywide	\$ 7,500,000
122	Sight and Sound Barriers - Powhite and Route 288	\$50,000,000
123	Sight and Sound Barriers - Powhite and Route 288, Phase 1	\$ 1,000,000
124	Signalization - various locations Countywide	\$ 500,000
127	State Park Mitigation Bank	\$ 500,000
128	Storage Lane Improvements - various locations Countywide	\$ 5,000,000
129	Subdivision Streets - resurfacing	\$ 1,250,000
130	Thoroughfare Plan Road Improvements - reconstruction and widening	\$15,000,000
131	Thoroughfare Plan Road Major Stream Crossings	\$ 5,000,000
132	Thoroughfare Plan New Roads	\$15,000,000
133	Traffic Calming Devices	\$ 500,000
134	Trellis - various locations Countywide (\$1.2 M/mile)	\$ 2,400,000
135	Unpaved Roads - reconstruct and pave - approximately one (1) mile per year	\$ 5,000,000



Insert link to attachment: Detailed Table of FY2018-2022 Transportation Unfunded Requests

Transit

Alternative modes of transportation such as buses, carpools and rail enhance mobility.

TRANSIT ALTERNATIVES

Land use patterns vary across Chesterfield County from regional commercial and business centers, to inner-ring suburbs and office parks, to low-density residential subdivisions. Much of the county's population lives in rural and suburban areas, but travels to jobs in the urban core or other suburban communities. Many people also need to travel from homes in the urban core to jobs in the suburbs. A wide range of transit options are available to help meet the diverse transportation needs of Chesterfield County. Alternatives range from fixed bus service, on-demand service and bus rapid transit. An overview of each potential transit alternative that could be explored within the county is summarized in the table below.

Alternative	Additional Information/Considerations
<ul style="list-style-type: none"> • Fixed Bus Service <ul style="list-style-type: none"> - Local Fixed Route Service <ul style="list-style-type: none"> ○ Very infrequent to very frequent service, all day service ○ Makes frequent stops ○ Operates in mixed traffic - Deviated Fixed Route Service <ul style="list-style-type: none"> ○ Operates along a fixed route at fixed times, but may deviate from route within a limited distance to collect/drop off passengers who have requested the deviation ○ Provides flexibility to reach dispersed riders as the ridership base and more transit-supportive land use patterns are established over time - Enhanced Local Service <ul style="list-style-type: none"> ○ Generally, service every 15 or 20 minutes all day ○ Relatively infrequent stops at main activity centers ○ Provides greater access and reliable service on key regional corridors where transit-oriented development opportunities may ultimately support BRT service later in the future - Express/Regional Routes <ul style="list-style-type: none"> ○ Provides long-distance regional connections via high-speed facilities ○ Supports commute trips to/from suburban activity centers - Paratransit <ul style="list-style-type: none"> ○ Available to pre-qualified user bases, especially for people with disabilities and the elderly (i.e. Access Chesterfield) ○ Federal law requires paratransit service be offered to those within ¼ mile on both sides of any fixed route service 	<ul style="list-style-type: none"> • Could be implemented in phases • Provide stops near neighborhoods, commercial areas, hospitals, colleges, etc. • Infrastructure enhancements are required to optimize performance: <ul style="list-style-type: none"> - Additional pedestrian infrastructure (sidewalks and paved shoulders) to provide access to potential transit locations - ADA compliant stops placed in accessible and walkable areas - Installation of traffic signals and right-turn lanes at intersections where buses will be turning around for safety and schedule adherence • Park and ride lots should be located at the end of transit lines to provide access to transit services

<ul style="list-style-type: none"> • Bus Rapid Transit (BRT) <ul style="list-style-type: none"> ○ Frequent service (10 or 15 minutes) ○ Infrequent stops (every 0.5 to 1.5 miles) ○ Stations with off-board fare collection and real-time arrival information ○ High capacity vehicles ○ Traffic signal priority and dedicated lanes 	<ul style="list-style-type: none"> • Long-term alternative <ul style="list-style-type: none"> ○ Short-term actions to begin fixed route service on corridors where no service currently exists should be considered to build ridership, if ridership is strong, could help make the case for future BRT investments ○ Will likely occur along corridors with transit oriented development and may be concentrated at potential higher density locations
<ul style="list-style-type: none"> • Microtransit or Demand Responsive Services <ul style="list-style-type: none"> ○ For areas outside fixed route service areas, or in place of fixed route where it is not cost effective ○ Door-to-door demand responsive service with no eligibility screening 	<ul style="list-style-type: none"> • Could become feeders to public transportation core routes <ul style="list-style-type: none"> ○ Addresses the "first-mile, last-mile" problem – the gap at the start and end of every trip that is difficult for traditional transit operators to serve in a cost-effective way • Feasible option to provide coverage to low-density corridors or rural dispersed communities • Typically privately owned and operated • High level of flexibility • Tailor operations to match travel behavior • Selective service offerings – focused on very limited routes or areas • More amenities and services • Various providers Uber, Lyft, Leap Transit and others

The Greater RVA Transit Vision Plan provides long-term transit recommendations summarized in the subsequent section. A short-term step is to complete a public transportation feasibility study to identify corridors and types of service that are viable options for transit in the nearer term. Initial studies should be data driven, examine land use and transportation together, and include the following key items:

- Determine overall goals for the recommended service:
 - Maximize ridership – provided along high-density corridors and provides more frequent, high-ridership service
 - Maximize coverage – provided along lower-density corridors, may provide lower-ridership but more area coverage
- Key factors evaluated for corridor selection should include the ability to implement incrementally (beginning where transit service exists), length of the corridor and service to key origins/destinations
- Recommendations should include the type of transit service, frequency of service, transit stop locations, day-of-week/time-of-day schedule, operational and capital costs, etc.

Key next steps and the identification of funding sources (local, state and federal) should be defined to implement short-term transit recommendations.

GREATER RVA TRANSIT VISION PLAN

This vision plan was initiated by the Virginia Department of Rail and Public Transportation (DRPT) and the Richmond Regional Transportation Planning Organization (RRTPO) and was developed in collaboration with all jurisdictions in the RRTPO region. The purpose of this vision plan was to assess the transportation system and make transit recommendations for the next 20 years for the Richmond region. Year 2040 recommendations and additional information on the Greater RVA Transit Vision Plan can be found at the following [link](#).

Specific recommendations in the vision plan for Chesterfield County include:

- Local route network in northern and central Chesterfield County.
- Recommendations for Bus Rapid Transit:
 - Along Midlothian Turnpike to Westchester Commons.
 - Along Hull Street to Magnolia Green.
- Recommendations for Enhanced Local Bus Service:
 - Along Jefferson Davis Highway to John Tyler Community College.
- Include feeder routes for bus rapid transit to/from western Hull Street.
- Route 288 identified as a key radial route through the region and was recommended as an express/regional route.
- Additional Park and Ride Lots throughout the region to facilitate BRT and express route access. Specific park and ride lots in the county have been funded through SMART SCALE and are described in a subsequent section of this chapter.

BUS SERVICES

Greater Richmond Transit Company (GRTC)

Greater Richmond Transit Company (GRTC), a major provider of bus service in the Richmond region, was established in 1973. GRTC was originally owned by Richmond. In 1989, the county acquired half of ownership in an effort to address regional transportation needs. Henrico was offered ownership opportunity, but chose not to participate. The overall direction of GRTC is guided by its Board of Directors, consisting of equal representation from Richmond and Chesterfield. For more information on GRTC routes, please click this [link](#).

Petersburg Area Transit (PAT)

The Petersburg Area Transit (PAT) predominantly operates in the Petersburg, Colonial Heights and Hopewell areas and extends to the Ettrick and Virginia State University area. In partnership with Greater Richmond Transit Company (GRTC), PAT also provides service to other destinations accessible by GRTC. This combination of routes enhances accessibility of the southern area of the county to and from surrounding jurisdictions and Fort Lee. For more information on PAT routes, please click this [link](#).

RideFinders

[Ridefinders](#) is a division of the Greater Richmond Transit Company (GRTC) that helps match commuters having similar work locations and hours who wish to share rides. Ride sharing includes private carpools and van services.

Access Chesterfield

Access Chesterfield, a county coordinated and funded van program, provides transportation services to low-income, disabled and elderly county residents. In Fiscal Year 2017, the county appropriated approximately \$1.7 million for Access Chesterfield. Under the current program, residents with medical or employment related needs are transported to areas within the county and the cities of Richmond, Petersburg, Hopewell and Colonial Heights. The service can also be used for trips that are not medical or employment related; however, travel is limited to within the county. There are approximately 8,500 registered Access Chesterfield passengers who accounted for a total of 56,182 trips in Fiscal Year 2017 (July 1, 2016 through May 6, 2017).

PARK AND RIDE LOTS

Park and ride facilities provide collection points for travelers to transfer from the private individual automobile use to transit, carpool or vanpool. When conveniently located and carefully planned and implemented, park and ride facilities are integrated into the overall transportation network and can encourage a shift from the single-occupant vehicle to transit or other alternative modes.

VDOT developed a Park and Ride Investment Strategy in 2014 for the Richmond region and identified the candidate park and ride locations based on regional travel patterns. The following locations were deemed the most feasible for a park and ride lot in Chesterfield County with two being programmed and included in the VDOT Six-Year Improvement Program:

- Hopkins Road near Chippenham Parkway
 - A 140-space park and ride lot is programmed (VDOT UPC 111714) to be constructed on Chesterfield County property (Fulghum Center) south of Cogbill Road east of Hopkins Road. Planned amenities will include bike racks with an awning, lighting, and space for a vehicle charging station. A sidewalk on Cogbill Road from the park and ride lot to Hopkins Road is also included to connect to the existing sidewalk system along Hopkins Road and provide access to various uses along the corridor. Pedestrian accommodations at the intersection of Hopkins Road and Cogbill Road will be included to facilitate pedestrian crossings at the traffic signal. Funding is programmed to begin preliminary engineering in Fiscal Year 2020 with a project estimate of \$2,945,000.
- US 360 near Winterpock Road
 - A 150-space park and ride lot at US 360 at Chital Drive is programmed as part of the SB RT 288 to WB US 360 Off-Ramp improvement project, with a total estimate of \$14,562,000 (VDOT UPC 111467). The park and ride lot will be constructed on Chesterfield County property (Career and Technical Center) and will include bike racks with an awning, lighting, and space for a vehicle charging station. Preliminary engineering is currently underway with construction estimated for Fiscal Year 2023.
- I-95 at Woods Edge Road (Exit 58)
- Courthouse Road near Powhite Parkway
- I-95 near Route 10 (Exit 61)
- Jefferson Davis Highway near Chippenham Parkway

The Greater RVA Transit Vision Plan also recommended additional park and ride facilities throughout the region to facilitate bus rapid transit and express route access and long-term transit recommendations.

PASSENGER RAIL SERVICE

A passenger rail station, Ettrick Station, located in the southeastern part of the county, is owned by CSX Transportation and leased by Amtrak. Amtrak trains run daily, providing passenger service by two routes:

- Carolinian/Piedmont service between New York City and Charlotte with stops in Philadelphia, Washington, Richmond and Ettrick.
- Silver Service/Palmetto service between New York City and Miami with stops at various locations along the east coast such as Washington, Charleston, Jacksonville and Orlando.



The *Intermodal Surface Transportation Efficiency Act of 1991* authorized planning and development of high speed rail corridors nationwide. The Richmond region is located on one of five original national corridors, the Southeast High Speed Rail (SEHSR) corridor from Washington to Raleigh. The SEHSR corridor plan proposes improvements in two phases:

- Washington to Richmond (Main Street Station)
- Richmond (Main Street Station) to Raleigh with planned stops in Ettrick.

At the request of the City of Petersburg, the Tri-Cities Metropolitan Planning Organization (MPO) has conducted an environmental assessment of potential sites for a future multimodal station location to serve Tri-Cities. The Tri-Cities Multimodal NEPA Study began with an evaluation of all potential sites with suitable track configuration and parcel availability. During the study process, the potential sites were pared down to three sites: Boulevard, Ettrick and S. Collier. These three sites have been fully evaluated as part of the EA. As of August 2017, all three sites are viable options for a future station location. In addition to the EA, a Transit Oriented Development (TOD) Analysis was conducted to look at the potential economic viability of the sites. Based on the results of the EA and TOD analysis, the study consultant has ranked the three sites relative to the following criteria: access, TOD potential, environmental impacts, land use and transportation integration, and implementation and operation. The Ettrick site is the study consultant's recommended site. Key features of the Ettrick site are listed below:

ENVIRONMENTAL ASSESSMENT (EA) – The formal process required by the National Environmental Protection Act, which is used to predict the environmental consequences (positive or negative) of large, federally, funded proposed projects. It includes analysis of impacts to traffic, socioeconomic groups, cultural resources and the natural environment.

- It is the least expensive option.
- It has the least environmental impacts.
- It requires minimal operational changes from Amtrak as it is the current station location.
- It is consistent with the Ettrick-VSU Special Area Plan and a key component to the revitalization of Ettrick, a substantial area ripe for development and redevelopment.

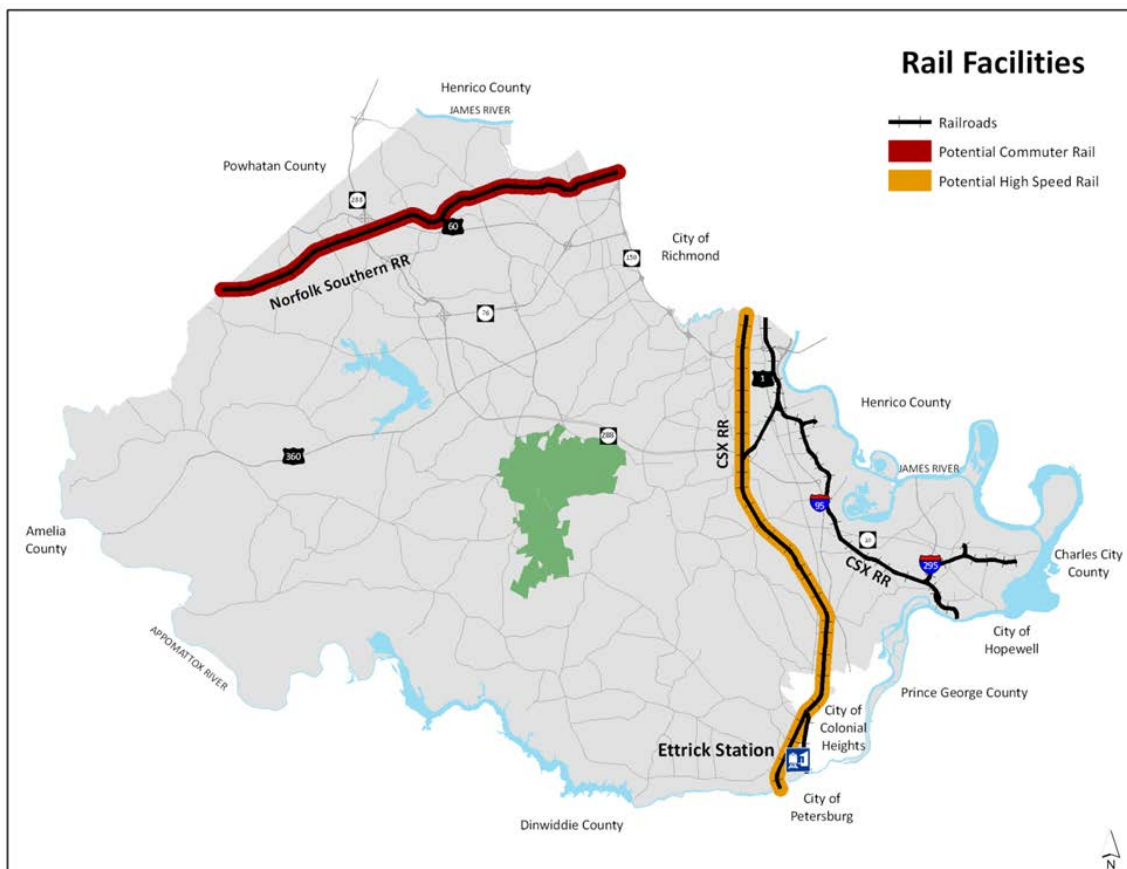
- It is within walking distance of Virginia State University and the Multipurpose Center, providing students, faculty and visitors with easy access to train service.
- Relative to S. Collier, it is closer to the urban core; therefore, is more accessible by the majority of the population.
- It requires minimal investment towards public infrastructure.

To accommodate a future Tri-Cities Multimodal Station, the Ettrick site will require construction of a new station and platform; site improvements for vehicular, transit, pedestrian and bicyclist circulation; and access improvements to Bessie Lane. State and federal funding sources for station construction are limited. It is anticipated that funding for station improvements will need to come primarily from the locality.

The final decision regarding the site will be made by the Federal Rail Administration (FRA). FRA will review the Final Environmental Assessment report, which will include the study consultant's recommendation along with public and local government comments.

FREIGHT RAIL SERVICE

Two freight railroads, CSX and Norfolk Southern, provide service to major consumer markets in the north, south and mid-west. CSX and Norfolk Southern Railroads provide a network of approximately 20,000 miles of track in 22 states and the District of Columbia and serve every major container port in the eastern United States. On-site freight rail service, via CSX railroad, is available for developments in the eastern part of the county. The Business Development chapter provides more information regarding developments that are served by direct rail access.



Other Transportation Modes

AIRPORTS

Richmond International Airport (RIC), a full-service airport with over 150 daily flights, is located 15 to 30 minutes from most areas in the county. It is owned and operated by the Capital Region Airport Commission. The Commission, which was established in 1975 and is governed by representative from area jurisdictions including Chesterfield County, directs the growth, operation and business activities of RIC. The airport has evolved into one of the most modern and well-equipped airports in the eastern United States.



Chesterfield County Airport (FIC) is located at the Route 288 and Route 10 interchange, within two miles of the County Government Center. The airport is designated by the Federal Aviation Administration (FAA) as an official general aviation reliever airport for Richmond International Airport (RIC). FIC has a 5,500-foot runway with an Instrument Landing System and associated lighting that provides all-weather operations. There are plans for expansion of the runway. Additional information regarding the Chesterfield County Airport can be found in the Business Development and Public Facilities Plan chapters.

WATER PORTS

The Richmond region is within 100 miles of the Port of Virginia at Hampton Roads. It is the third largest container port and offers the deepest shipping channels on the United States east coast. The Port of Virginia is a hub for the world's leading international shipping companies, with global service from more than 75 international shipping lines and 3,000 sailings annually to 100 countries.

The Port of Richmond is in close proximity to the county, and easily accessible by rail or truck. The Port is a domestic and international freight and distribution center serving the mid-Atlantic region. As an alternative to truck freight shipment, barges carry goods and material between Hampton Roads and Richmond. This barge service removes truck container traffic off local roads and highways. The Port of Richmond currently handles 6,000 shipping containers a year, which removes about 12,000 truck trips a year from the roads.



General Transportation Guidelines

The General Transportation Guidelines assist in planning, coordinating and implementing a multimodal transportation system for the county that is consistent with the values of the community, and assist in formulating recommendations for specific development proposals.

Major considerations in the development of these guidelines include:

- ❖ A safe, efficient and cost effective transportation system.
- ❖ A transportation system that supports existing and future development patterns.
- ❖ Multimodal transportation and mobility needs for people and commerce.
- ❖ Bicycle and pedestrian accommodations in the planning and design of road improvements, where appropriate.
- ❖ Acquiring rights of way to accommodate travel demands including future multimodal transportation infrastructure.

The following General Transportation Guidelines should be used when addressing specific development proposals and when making other transportation decisions:

- **Funding.** Seek any and all funding opportunities for planning, coordinating and implementing a comprehensive transportation system.
- **Levels of Service.** Monitor levels of service relative to traffic congestion changes to assist in identifying and prioritizing needed transportation improvements.
- **Zoning and Development Proposals.** Support development proposals that:
 - Manage density and land uses based upon more detailed studies than those done for the Comprehensive Plan. Such proposals should provide for mitigating transportation improvements that adequately address the traffic impact of the proposed development.
 - Provide for road improvements and right of way dedications in conformance with the Thoroughfare Plan.
 - Demonstrate that an acceptable level of service will be achieved with the provision of agreed upon and committed transportation improvements.
 - Limit the number of direct accesses and proposed road intersections along major arterial and collector roads.
 - Provide access management that meets or exceeds VDOT guidelines, and emphasizes appropriate local access while balancing traffic safety and road capacity.
 - Achieve development integration in accordance with The Land Use Plan chapter to improve local traffic movements and pedestrian accessibility.
 - Look for improvements with development in accordance with the Bikeways and Trails plan.
 - Encourage Park-and-Ride lots at appropriate locations that maximize their use.

- **Connectivity.** Encourage new developments to provide bikeways, sidewalks and other pedestrian facilities where appropriate. Encourage context sensitive designs in areas designated on the Land Use Plan Map for compact development or mixed uses.
- **Transit.** Support long-term transit accommodations where appropriate in accordance with the Greater RVA Transit Vision Plan which was approved by the MPO of which the county is a member. Complete the short-term step of conducting a public transportation feasibility study to identify corridors and types of service that are viable options for transit in the nearer term.
- **Special Area Transportation Needs.** Consider detailed transportation planning in conjunction with the development of Special Area Plans.